OLYMPIC VIEW AQUATIC RESERVE SITE PROPOSAL APPLICATION

1. GENERAL SITE INFORMATION

A. Site location:

The Olympic View site is a 12.4-acre restoration site located within Commencement Bay on the headland between Thea Foss and Middle Waterways and adjacent to the Puyallup River (figure 1). The site includes approximately 0.7 acres of filled tidelands.

B. Site Overview:

1. General site description

The Olympic View site is a 12.4-acre restoration site. The site includes 0.7 acres of restored upland owned by the City of Tacoma and 11.7 acres of state-owned aquatic lands. The site is a recreation of a typical nearshore environment found in the Puget Sound (though not typical habitat found in the historic Puyallup River Delta). The site does include approximately 1.5 acres of eelgrass. This is thought to be one of the largest remaining patches of eelgrass remaining in Commencement Bay.

2. Boundaries description (include section, range and township, county)

That portion of the harbor area fronting and abutting Blocks 29, 30 and 31 of the Amended Supplemental Plat of Tacoma Tide Lands, Sheet 4, approved by the Board of State Land Commissioners October 7, 1902, described as follows: That portion of the harbor area bounded by the inner and outer harbor lines, the easterly line of City (Thea Foss) Waterway and the westerly line of Middle Waterway.

3. Current ownership (include detailed ownership map). Identify the intertidal & subtidal areas included in the site

The site includes 0.7 acres of restored upland owned by the City of Tacoma and 11.7 acres of state-owned aquatic lands. The site is primarily in the intertidal zone but does include some subtidal area.

4. Current county shoreline designation and description

The Olympic View site is located within the City of Tacoma Port Maritime and Industrial District. The adjacent upland area is designated for intense urbanized development in the City of Tacoma Shoreline Master Program.

Figure 1: Olympic View site overview.

C. Justification for proposal: (briefly summarize the reason for establishing the aquatic reserve)

The purpose for the consideration of this site as an aquatic reserve is to establish permanent sites for the restoration and remediation of habitat patches in the Puyallup River estuary and corridors that link to the Puyallup River "neodelta." The site is located in the landscape scale contiguous corridor of aquatic and nearshore habitat that is being restored within the estuary of the Puyallup River. This corridor, referred to as the "Delta Reserve Concept" by DNR scientist Bill Graeber, has been the focus on-going and extensive restoration efforts since 1988. Habitat in the corridor is being actively remediated and returned to a valuable and functioning condition. The Delta Reserve

Concept, of which the Middle Waterway reserve is a part, insures that the functions and values of the Puyallup River estuary will be rehabilitated to the fullest extent possible in this highly urbanized and developed bay. The aquatic reserve designation is a management option to ensure continued environmental protection, preservation and enhancement of the restored estuarine and delta habitats in Commencement Bay, providing both direct and indirect benefits to all species dependent on them. As part of the greater landscape scale Delta Reserve habitat restoration concept, this area provides critical habitat for out-migrating juvenile salmonid, including the ESA listed White River Spring-run Chinook, which is the only native Spring-run Chinook stock in South Puget Sound. Additionally this area provides refuge and feeding for a variety of other aquatic species, including fish, migratory waterfowl and mammals.

Species monitoring at the Olympic View site is limited to fish observations. The greatest diversity of fish (29 species) was found at Olympic view of all the restorations sites that were monitored. However, smaller quantities of anadromous fish were caught at this site than the other restoration sites. The greatest number of fish found were, Shiner perch, Sculpin species, and Saddleback gunnels (Ridolfi 2003).

Two small eelgrass beds exist within this site. Eelgrass beds are extremely valuable rearing habitat for many aquatic species, and estimates suggest that only 12 acres of eelgrass exist within Commencement Bay (DNR 1991).

D. The ecological and cultural quality of the site

1. What is the current condition of the site?
    - Is the site degraded?

The site has been impacted by nearly a century of industrial development, and artificial habitat creation in the form of filled wetlands which form the peninsula between Thea Foss and Middle waterways. Puget Sound Plywood which commenced mill and associated plywood operations at the project site in June 1942 developed the area immediately shoreward and adjacent to the site. Facilities were operated until the 1980's and the company ultimately filed for Chapter 11 reorganization under the U.S. Bankruptcy Code in November 1985. The case was converted to Chapter 7 liquidation in December 1994 (Tacoma 1997). The building extended over the intertidal covering approximately 1 acre of land and was supported by several hundred piers, some of which were wrapped in concrete. The site included an industrial wastewater discharge into the site until the early 1980's with small periodic flows through 1987 (Hart-Crowser 1992). Overwater and in water portions of this structure were removed during restoration activities between June and September 2002. Restoration efforts included the reconstruction of a sloping beach that approximates what a natural slope would be and included planting riparian vegetation along the shoreline and filled uplands.

Superior Oil operates a facility adjacent to the filled tidelands on the southwest shore of the site. Oil contamination in the soil was first noted during geotechnical drilling in 1980. Upgrades to the site have included the installation of a spill containment system, and the drilling of numerous test and recovery wells (Tacoma 1997).

- Are non-native species found at the site?

The site occurs in an urban embayment that includes an active commercial shipping port, and is therefore likely to be influenced by a variety of non-native invertebrates. In 1998 and 2000 DNR led efforts to survey non-native species within the Central Puget Sound Basin, much of which took place in Elliot Bay to the north. Combined surveys detected 21 non-native species with most being native to the North Atlantic or Northwest Pacific (Cohen et al. 2001). Pre-construction reports describe the shorelines of restoration sites as being "dominated by an expanse of Himalayan blackberry (Rubus discolor)" (Tacoma 1997). A variety of ubiquitous herbaceous plants and Himalayan blackberry appear to be the primary invasive plants adjacent to the site. Several common non-native birds occur at or near the site (e.g., European starlings), and others are likely more abundant than historically due to anthropogenic influences (e.g., Canada goose) (Ridolfi 2003).

- Are there water quality concerns associated with the site?

Olympic View lies within Commencement Bay. The Commencement Bay Nearshore/Tideflats was placed on the National Priorities List of sites requiring investigation and cleanup under EPA's Superfund Program in September 1983. Following investigation, EPA identified a number of problem areas where chemicals pose a risk to human health and the environment (EPA 1989). Sediment samples indicate contamination exceeded sediment quality objectives for PCB and copper (Tacoma 1997). Remediation work took place between June and September 2002 and included the removal of concrete and wood pilings, and a portion of a building formerly owned by the defunct Puget Sound Plywood Company in addition to sediment removal (Ridolfi 2003). Part of the remediation process for this site consists of covering the contaminated sediments with a layer of clean medium to coarse-grained sand approximately one-meter (3-feet) thick. This cap is used to isolate contaminants and limit their vertical migration and release into the water column. The cap will also limit the potential for marine organisms to reach the contaminated sediment (Federal Register 2003).

Within the Foss Waterway immediately to the south of the site, sediment samples exceeded EPA Sediment Quality Objectives for lead, zinc, and fluorine. In addition, contaminants were at the objectives for phenanthrene and anthracene (Hart-Crowser 1994). Sediments in Thea Foss Waterway are scheduled to be removed or capped in 2003. In addition, contaminants were identified in the mouth of Middle Waterway, immediately to the east of the site. Sediments at the mouth of Middle Waterway exceed standards for arsenic, lead, mercury and copper in surface samples. Mercury, arsenic, lead and PCB's exceeded standards within core samples, with arsenic and copper exceedences limited to the first 10 cm, and PCB exceedences at approximately 1 foot depth (Tacoma 1997). Sediments in the mouth of Middle Waterway are scheduled to be removed through dredging in 2003 (EPA 2002).

- Are there signs of habitat loss within the site?

All uplands adjacent to the site were likely historic intertidal or subtidal lands. Additionally, a portion of the site remains bulkheaded with rip-rap and in the upland despite being between the inner and outer harbor lines. Recent restoration efforts have removed major overwater and inwater structures that once dominated the shore on the eastern portion of the site. The eelgrass is divided into two beds by a deep area referred to as the "hole" in the center of the site (figure 2). There is speculation that the hole was created by scour resulting from log handling practices that were centered in that area (Tacoma 1997).

- Are there signs of habitat loss within the biogeographic region?

Several major bays in the Central Puget Sound region have been filled, diked, and dredged extensively. Over the past century, 97 percent of the shallows and flats in the Duwamish Estuary and Elliot Bay have been lost (Blomberg et al. 1988) and 95 percent of the estuarine habitat in Commencement Bay has been lost to development (Bortelson et al. 1980). The proportion of marine shorelines modified in Central Puget Sound is higher than any other part of Washington with 59.1% of shorelines modified and 18.3% of shorelines comprised of man-made materials (Berry et al. 2001). In addition to intertidal modification, most major bays in Central Puget Sound are dredged on a regular basis for navigational purposes.

- Are ecosystem processes (e.g., freshwater flow, littoral drift, nutrient cycling, etc.) intact?

High volumes of sediment carried by the Puyallup River result in siltation in the bay. This is thought to be one of the factors limiting eelgrass beds in the bay, which historically have been scarce to absent (Thom et al. 1991). A typical sediment plume is shown in figure 3. Introduction of a freshwater channel to Middle Waterway may increase turbidity at the site.

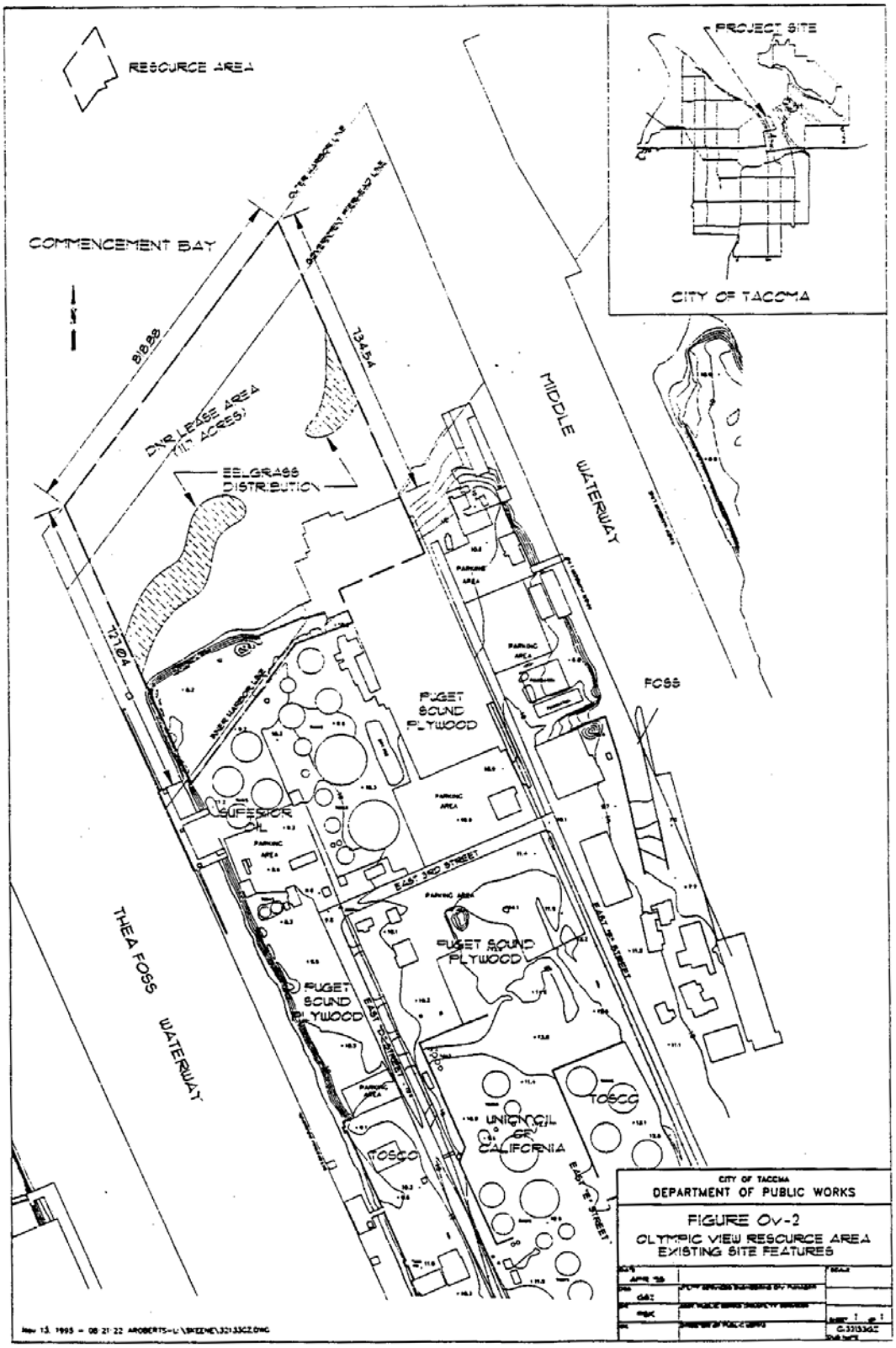

Figure 2: Diagram of site and adjacent landuses (Tacoma 1997).

Figure 3: Aerial view of Puyallup river sediment discharge

2. Risks to the ecosystem or feature of interest (If applicable)
    - Can threats contributing directly to the area's decline be prevented through reserve establishment?

The present day clean-up actions and future management of the site, and restored areas surrounding the site, defined in the settlement agreement between the City of Tacoma, DNR, EPA and other entities (trustees) are the actions that eliminate activities within the site that could result in any future direct threats to the site's decline. Intense industrial development will continue to the south of the site and has the potential to directly contribute to the site's decline. Threats of particular concern are the proximity of the site to the Superior Oil bulk facilities and the potential for oil spills, the recent use of the site for derelict vessel storage, potential contaminant mobilization from on site or adjacent restoration efforts, and uncertainties associated with development of a freshwater channel entering Middle Waterway.

3. Restoration potential
    - Is there pending restoration at the site?

The site has been a site for sediment remediation associated with the Commencement Bay Nearshore/Tideflats superfund designation. Restoration activities have focused on the removal of contaminated sediments, overwater structures, and pilings in addition to creating a sloping shoreline along a portion of the site. The western side of the site

continues to have a rip-rap bulkhead protected filled uplands which have been planted with what will become a riparian area. The upland vegetation will require extensive monitoring, watering, and re-planting to ensure successful establishment of trees and shrubs. Potential future restoration at this site could include removal of the existing waterward bulkhead and shoreline grading.

Sediment remediation and clean-up projects are planned or have taken place in both Thea Foss and Middle Waterways. St Paul Waterway to the east is scheduled to be filled in 2004 and future restoration plans call for the development of a freshwater channel connecting Middle Waterway to the Puyallup River. These planed and active restoration projects will act to increase the ecosystem value of habitats found at Olympic View.

- Would restoration benefits extend beyond site boundaries?

The site is relatively small and most of the biota spends only a portion of its life within the proposed site. The site provides foraging habitat for a variety of fish and bird species that rear, feed and nest elsewhere in addition to this site.

4. Special value for biodiversity or species diversity
    - Does the proposed site capture habitat used regularly by species of special conservation interest?

The National Marine Fisheries Service has identified Chinook salmon (*Oncorhynchus tshawytscha*), a threatened species, and coho salmon (*O. kisutch*), a candidate species as occurring in the vicinity of Olympic View. Additionally, the United States Fish and Wildlife Service has identified bald eagle (*Haliaeetus leucocephalus*) and bull trout (*Salvelinus confluentus*), both threatened species, as occurring in the vicinity of Olympic View (Anchor Environmental and Foster Wheeler 2000). Additional endangered or threatened species that are regularly observed in Commencement Bay include marbled murrelets (threatened), and peregrine falcons (threatened) (USFWS et al. 1996).

- Does the proposed site capture vulnerable habitats, life stages or populations? (Vulnerable habitats, life stages or populations include: seal haul-outs, breeding bird aggregations or rookeries, seasonal bird aggregations, seasonal fish aggregations (feeding or breeding), or fish spawning aggregations)

The site contains the only known eelgrass bed occurring along the face of the Puyallup delta. Additional eelgrass beds within Commencement Bay are noted further to the north (Thom et al. 2000). Eelgrass (*Zostera marina*) is listed as a priority habitat by WDFW and the scarcity of eelgrass within the bay likely enhances its value. Eelgrass beds provide habitat and feeding grounds for important species including juvenile salmonids, forage fish, and great blue heron (Simenstad 1994).

5. Ecological processes that sustain the aquatic landscape
   - Would protection of the site protect/maintain ecological processes?

By limiting disturbance and preventing incompatible uses the site's primary features are likely to be retained. Habitat enhancement and protection at Olympic View may be incompatible with other restoration activities within Commencement Bay, especially the proposed development of freshwater flow in Middle Waterway that is likely to increase turbidity in that waterway and at Olympic View. Increased turbidity may diminish or eliminate eelgrass beds found at Olympic View. Some Commencement Bay restoration efforts focus on goals of restoring historic ecosystem features and processes, while others focus on protecting and enhancing current ecosystem features and processes even though historic and current ecosystem features may be incompatible with each other. Restoration and protection efforts should focus on landscape scale efforts that may include trade-offs among sites and ecological function (e.g., Simenstad 2000).

6. The cultural quality of the site
   - Does the site contain or protect significant cultural resources? (Does the site contain heritage, historical, or cultural resources that are eligible for the Wa. Register of Historic Places, RCW27.34.220 or the National Register of Historic Places? Evaluate the value of those described in the proposal from a regional or statewide basis (ex. sites listed on the state or national historical register or significant historical indigenous use areas would have high values.)

The site contains no significant cultural resources (per discussion with Bill Sullivan with the Puyallup Tribe). Industrial developments adjacent to the site are common to maritime commerce and the City of Tacoma.

<u>E. Habitats and features represented within the site</u>

1. Is the site a good example (relatively undisturbed) of representative habitat as compared with the overall reserve program goal?

   - Does the proposed site capture species or habitats that are much less common within the biogeographic region than they were historically?

The site is a recreation of a typical nearshore environment found in the Puget Sound, but not common the Puyallup River Delta.

The site contains the only known eelgrass bed occurring along the face of the Puyallup delta. Additional eelgrass beds within Commencement Bay are noted further to the north (Thom et al. 2000). Eelgrass (*Zostera marina*) is listed as a priority habitat by WDFW and the scarcity of eelgrass within the bay likely enhances its value. Eelgrass beds provide habitat and feeding grounds for important species including juvenile salmonids, forage fish, and great blue heron (Simenstad 1994).

2. Does the site include habitat types that are under-represented in the aquatic reserves program or marine protected area network?

    - Does the site contain representative habitats not otherwise protected in the network of protected areas or aquatic reserves?

See E.1 above.

3. Does the site include a biogeographical location that is under-represented in the aquatic reserves program or marine protected area network?

    - Is the site located in a biogeographic region or sub-region that is underrepresented in the existing reserve network?

Only two small Marine Protected Areas (MPAs) exist in the Central Puget Sound basin. Middle Waterway, a 20-acre mudflat at the head of Middle Watery to the east of the site, has also been proposed for Aquatic Reserve status.

Areas protected or restored by the Natural Resource Trustees are to be protected into perpetuity (Commencement Bay Natural Resource Trustees 1997).

F. Viability of the occurrences of interest

1. Site features meet the intent of the reserve
    - Are species, habitats or ecosystem processes consistently associated with reserve site?

Yes. See section C.

2. Number of conservation targets

    (SEE "Special value for biodiversity or species diversity" section C.4)

3. Number of ecological processes
    - Does the site contain unique or distinctive physical habitat features (e.g., oceanographic gyre, oceanographic sill, natural beach spit, etc)?

The site appears to be fairly typical of bay face habitat with little protection from wave exposure.

- Does the site contain unique or distinctive biological processes (larval rearing zooplankton concentrations, aggregation sites, etc.)?

Commencement Bay contains few areas of productive nearshore habitats. Comments elsewhere capture the unique value of the site for eelgrass. In addition, relatively few stretches of shoreline have riparian vegetation within the Bay. Riparian vegetation is an important source of food and habitat for juvenile salmonids (Cordell et al. 2002).

G. Defensibility of the site

1. Complementary protection within a reserve or protected area network. (See: *Habitat types that are under-represented in the aquatic reserves program or marine protected area network* – section E.1*)*
2. Connectivity to a reserve or protected area network and/or for species and/or habitats
    - Is site adjacent to existing marine or freshwater protected areas administered for conservation or restoration purposes?

There are several restoration sites (see figure 4) in the "delta reserve" that are being administered for conservation (see supplementary attachment – Natural Resources in Commencement Bay, Restoration Projects in Commencement Bay).

- Does the site provide regional habitat connectivity through any of the following functions? Refuge (predator, physiological, high energy), food production, migratory, corridors, spawning, nursery or rearing, riparian vegetation, adult habitat, other functions. Connectivity should be established in a referenced publication(s).

The Olympic View site is located in the landscape scale contiguous corridor of aquatic and nearshore habitat that is being restored within the estuary of the Puyallup River. This corridor, referred to as the "Delta Reserve Concept" provides a continuous corridor of protected habitat from approximately River Mile 1 in the Puyallup River to the Commencement Bay estuary and across to the mouth of Thea Foss Waterway. This corridor is protected by a series of deed restrictions in perpetuity that limit the use of the area to habitat for fish and wildlife. Nearshore restoration habitat sites established in the estuary include (figure 4):

Figure 4: Restoration sites developed through Commencement Natural Resources Damage Assessment activities.

3. Appropriate size to be sustainable
    - Is area large enough to be self-sustaining?

The site is relatively small. Long-term management by the City of Tacoma, the U.S. Coast Guard, and DNR is focused on the maintenance of the features of the site.

4. Ability to persist over time

Eelgrass beds developed at the site during adverse conditions which have since been eliminated. Therefore it is likely that eelgrass beds will remain and possibly expand at the site since impacts from overwater structures, derelict vessels and wood storage have been eliminated.

- Can site be successfully managed to maintain the features of interest?

The site's value is currently primarily related to the eelgrass beds found within the site. Continuing restoration activities are likely to lead to the development of a riparian buffer along the nearshore which will provide shade and food to the nearshore. Care must be taken to ensure that efforts to introduce freshwater to Middle Waterway (HDR 1999) do not increase turbidity or otherwise displace eelgrass from the site.

- Are there known anthropogenic or natural threats to the continued viability of the site?

Sediment removal, remediation and habitat restoration continue within Commencement Bay (see figure 5). Restoration at the site continues to be a work in progress with monitoring and adaptive management scheduled to continue for at least the next four years. Removal of polluted sediments within the mouths of Middle and Thea Foss waterways will take place in 2003. While these efforts will facilitate the long-term recovery of the local ecosystem, they are likely to have short-term adverse affects to the benthos biota (Anchor Environmental 2000). Additionally, while remedial actions have been implemented for contamination sources, these remedial actions are continuing to be monitored to assess their effectiveness and sources including seeps draining adjacent uplands may continue to pollute the site (Ecology 1994). In addition, intense urbanized development will continue to surround the site and has the potential to directly contribute to the site's decline.

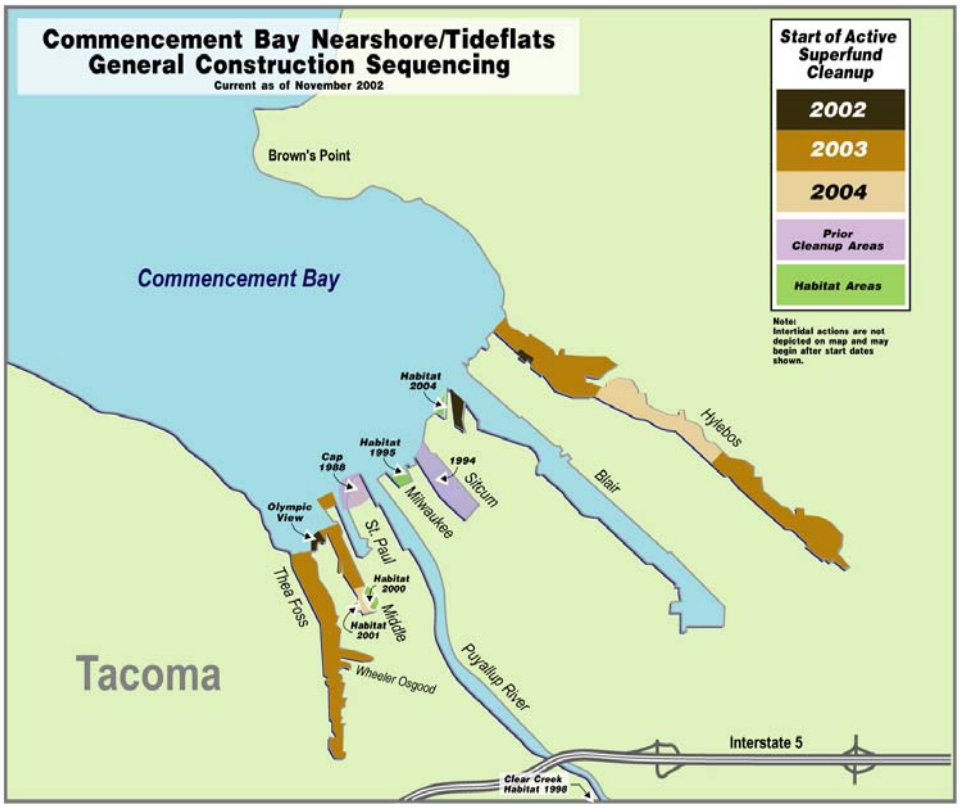

Figure 5: Diagram of superfund restoration progress and future plans (Source EPA 2002).

5. Known or anticipated activities that endanger the site or habitat
   - Are proposed land uses or modifications compatible with reserve designation? (Modifications of interest are described in Appendix A)?

Recent and proposed land use in and adjacent to the proposed site has included contaminated sediment removal and remediation, and habitat enhancement of previously industrialized shorelines. These activities have eliminated major stresses to the local ecosystem and have created riparian buffers between the site and adjacent industrial areas. These activities tend to support conservation and restoration of the Olympic View site.

6. Potential for factors contributing directly to the area's decline to be prevented
    - Would reserve status provide protection for habitats, species or processes of interest from encroachment?

Reserve status might provide longer-term protection of the features of the site than existing (settlement) management requirements. However, reserve status will not likely result in lessening the impacts of the high intensity industrial uses that occur, and will continue to occur adjacent to the site.

H. Manageability of the site

1. Coordination with other entities, including local jurisdictions and current leaseholders
    - Has another entity previously identified this site or areas within the site as a priority for protection? *(Examples include Important Bird Areas (Cullinan 2001), priority areas for Research Natural Area Designation (Dyrness et al. 1975), or priority areas for conservation (e.g., through ecoregional planning, Natural Heritage Program research (Kunze 1984), or similar process (Dethier 1989))*

The proposed site was identified as a 'special aquatic site' by the Army Corps of Engineers (1993) (figure 6). A later restoration plan designated protection and restoration of the eelgrass and shoreline as 'medium importance' based upon an analysis of the potential site's suitability for restoration (Commencement Bay NRT 1997). Following these reports other documents related to the restoration of Commencement Bay have identified Olympic View as an important component of overall restoration of the Commencement Bay ecosystem (e.g., Simenstad 2000).

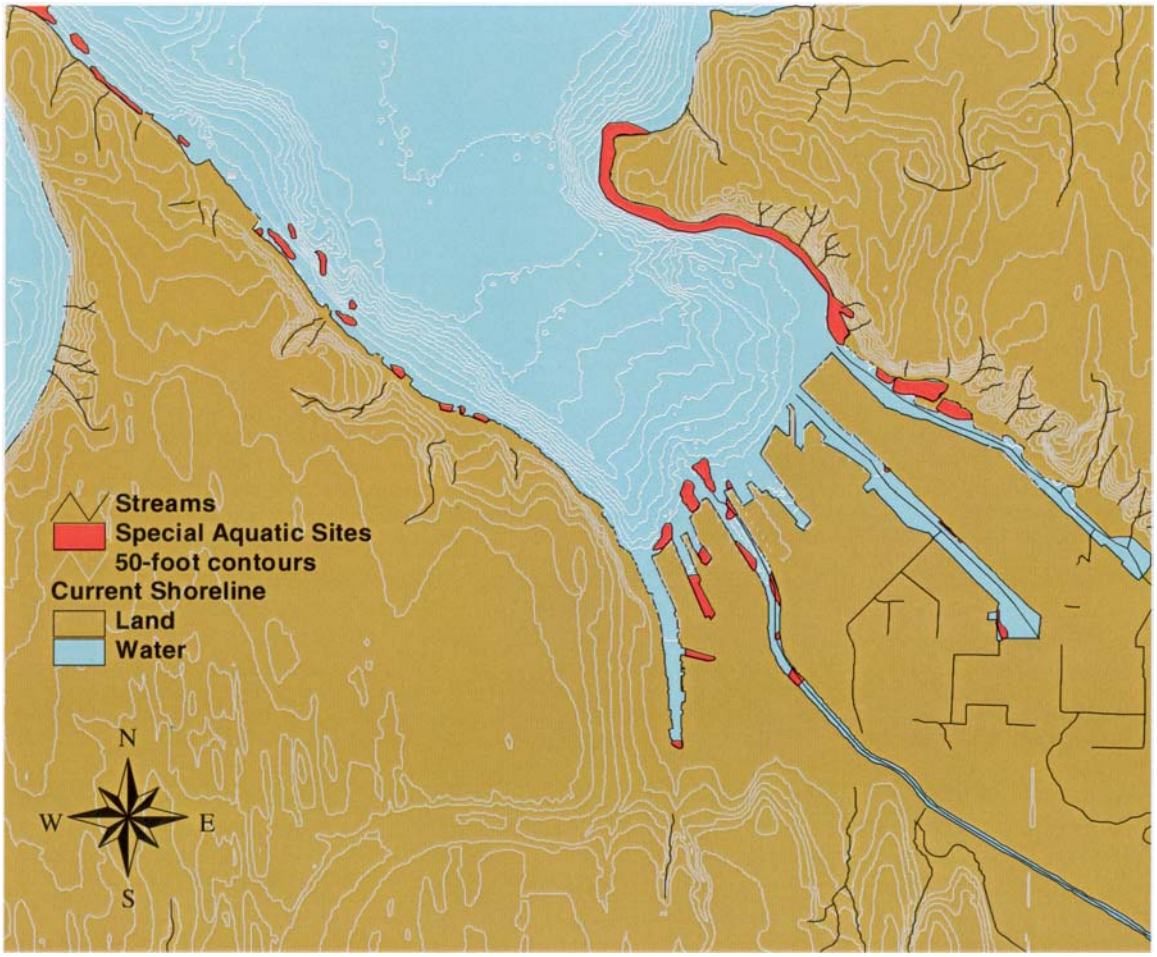

Figure 6: Special Aquatic Sites identified by ACOE 1993.

2. Potential cooperative partners for management, monitoring, or enforcement
   - Have potential cooperative management partners been identified? [1]

- City of Tacoma. Required under the January 1997 consent decree to permanently secure the right of use and preservation and restoration of the site to the west of the reserve site. The City has expressed a commitment to the restoration and continued management of the site.
- Puyallup Tribe of Indians. The area of the site is included in the Tribes usual and accustomed area. The Tribe is also one of the parties identified as a trustee in the January 1997 consent decree. Bill Sullivan, the Natural Resources Director for the Tribe has expressed support for the reserve. No additional management commitments regarding the proposed reserve have been made with the Tribe.

[1] This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent best management principles that the Aquatic Reserve program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

- The entities involved in this landscape scale endeavor include the Commencement Bay Natural Resource Damage Assessment Trustees (NRDA) (includes NOAA, USFW, Puyallup Tribe, Muckleshoot Tribe, State of Washington), Port of Tacoma, City of Tacoma, Simpson/Tacoma Kraft and others.

3. Adjacent natural areas or public lands
    - Is site adjacent to terrestrial protected areas managed for conservation or restoration purposes?

The southwest corner of the site includes a 0.7-acre upland restoration site owned by the City of Tacoma. Otherwise, the remainder of the upland is utilized by commercial activities.

The reserve area is included within a harbor area.

4. Provide a description of how to measure success (i.e., monitoring).
    - *See 'Kinds of monitoring needed'* (below)

5. Describe kinds of monitoring needed
    - Does reserve proposal include a monitoring plan that measures reserve progress towards goals and provides for adaptive management?[2]

Non-reserve related remedial actions have been implemented for contamination sources, these remedial actions are continuing to be monitored to assess their effectiveness and sources including seeps draining adjacent uplands may continue to pollute the site (Ecology 1994).

6. Kinds of enforcement needed to make sure incompatible uses and impacts do not encroach on reserve.
    - What kind of enforcement is needed to prevent incompatible uses and impacts from encroaching on the reserve?

The overall management and monitoring of the site is the responsibility of the City of Tacoma according to the January 1997 consent decree for restoration of this site and several other sites. A monitoring plan for the restoration site was developed for fish monitoring (Rice et al. 2002).

[2] This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent best management principles that the Aquatic Reserve program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

5. Does the site serve or conflict with the greatest public benefit?

- Does reserve status represent the greatest public benefit?

Presently, the preferred use for this site identified as having the greatest public benefit has changed from supporting heavy industry to providing a site for habitat restoration.

- Is reserve status compatible with existing or proposed adjacent uses?

It is consistent with the existing and future restoration sites immediately adjacent to the proposed reserve site. The use of the site for restoration purposed is consistent with the proposed use for the site and was developed with the understanding that the area will be utilized for restoration purposes. It is difficult to determine at this point if the site will continue to be compatible with existing adjacent upland uses in the long term. The Coast Guard has established a permanent regulated navigation area over the site that prohibits activities that would disturb the seabed, such as anchoring, dredging, spudding, laying cable, or other disturbances of the bottom (Federal Register 2003). Initial designs for the site included the development of institutional controls. Institutional controls, including designation of the site as an environmental reserve and signs to educate the public on protection of natural resources, would be established at the site to limit disturbance (Tacoma 1997).

- Assess the direct use, indirect use, option, and non-use values associated with the site.

There are no existing commercial uses at this site. The site would benefit from continued restoration adjacent to the site, including continued planting and management of existing restoration sites. Introduction of a freshwater outlet within the Middle Waterway would improve the site for salmonid access and use, however increased turbidity may adversely affect existing eelgrass communities. Long-term plans call for use of upland portions of the site as a recreation and educational area (Tacoma 1997), however the site is currently fenced and access is restricted.

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